

WHAT IS CLAIMED IS:

1. A method of manufacturing a reflection type mask blank by forming a multilayer reflection film reflecting exposure light on a substrate and forming an absorber layer absorbing the exposure light on the multilayer reflection film, the method comprising:

a step of forming, between the substrate and the multilayer reflection film, on the multilayer reflection film, or both between the substrate and the multilayer reflection film and on the multilayer reflection film, a stress correction film having film stress opposite in direction to film stress of the multilayer reflection film and smaller in absolute value than the film stress of the multilayer reflection film;

a step of heat-treating the stress correction film; and

a step of heat-treating the multilayer reflection film.

2. A method of manufacturing a reflection type mask blank as claimed in claim 1, wherein the step of heat-treating the stress correction film and the step of heat-treating the multilayer reflection film are carried out simultaneously.

3. A method of manufacturing a reflection type mask blank as claimed in claim 1, wherein the stress correction film is formed on the substrate, the stress correction film is heat-treated, the multilayer reflection film is thereafter formed on the stress correction film, and the multilayer reflection film is heat-treated.

4. A method of manufacturing a reflection type mask blank as claimed in any one of claims 1 through 3, wherein the heat treatment is carried out at a substrate heating temperature higher than a temperature upon deposition of the stress correction film and not higher than 200 °C.

5. A method of manufacturing a reflection type mask blank as claimed in any one of claims 1 through 3, wherein the film stress of the stress correction

film before the heat treatment falls within a range between 0 and +300 MPa.

6. A method of manufacturing a reflection type mask blank as claimed in any one of claims 1 through 3, wherein the stress correction film is increased in stress in a tensile direction by the heat treatment.

7. A method of manufacturing a reflection type mask blank as claimed in any one of claims 1 through 3, wherein the stress correction film is made of an amorphous material comprising metal or alloy.

8. A method of manufacturing a reflection type mask, wherein a pattern is formed on the absorber layer of the reflection type mask blank produced by the method claimed in any one of claims 1 through 3.

9. A method of manufacturing a semiconductor device, wherein a fine pattern is formed on a semiconductor substrate by lithography using the reflection type mask produced by the method claimed in claim 8.